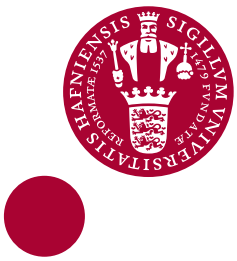

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Adolescents' Health Behaviours In Relation to Dental and Medical Consultation in Tanzania

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ABSTRACT

Background: Health behaviours have direct influence to individuals' health and remain major explanatory factors for the differences in health-related outcomes.
Aim: To investigate adolescents' hygiene behaviours, dietary behaviours and the associated dental and medical consultation.
Materials and Methods: A cross-sectional survey that was carried out in twelve regions of Tanzania among school going adolescents. A structured questionnaire was used for data collection. Data processing and analysis was done using SPSS computer program version 20, whereby proportions, cross-tabulations for bivariate analysis and binary logistic regression in OR (95% CI) for multivariate were conducted. The level of significance was set at p-value < 0.05.
Results: 4,847 adolescents aged 11-17 years participated in the study. Slightly more than half (51%) exhibited good hygiene behaviours, 36.3% often consumed at least three sugary items, 76.2 % vegetables and 42.1% fresh fruits. Significantly larger proportions of older adolescents (55.6%), secondary school attendees (56.4%), adolescents whose fathers (55.8%) and mothers (54.5%) had secondary to university education demonstrated good hygiene behaviour as compared with their counterparts. The odds of having good hygiene behaviours were higher among those who had visited a medical doctor 1.4 (1.2, 1.6). Higher odds of frequent sugar consumption were seen among adolescents who had visited a dentist 1.6 (1.4, 1.9).
Conclusion: Adolescents had good hygiene behaviours; tooth brushing being the most practiced behaviour. Sugar consumption frequency was noteworthy whereas eating vegetables was the most reported healthy eating behaviour. Good hygiene and frequent sugar consumption were positively associated with medical and dental consultation.

Key Words: hygiene practices; dietary practices; adolescents; dental consultation; medical consultation

INTRODUCTION

Human behaviours are important to individuals' health and remain major explanatory factors for the differences in health-related outcomes. [1] Furthermore, health and well-being of the people, adolescents inclusive are strongly linked to lifestyle factors, all of which involve

behaviours that are potentially controllable by the individual. These behaviours include dietary activities, hygiene practices, tobacco use and physical activity. [2]

Good dietary behaviours promote health and are prerequisite for growth and development. According to the American Heart Association, a healthy diet should mainly be composed of fruits and vegetables, with lesser proportions of whole grains, low-fat and nonfat dairy products, beans, fish, and lean meat. [3] It further recommends limited use of sugar and salt. The World Health Organization (WHO) states that unhealthy diet and lack of physical activity are leading global risks to health. [4]

The most notable effect of nutrition and dietary behaviours on oral health is the local action of diet on teeth leading to development of dental caries and enamel erosion. [5] Dental caries development is associated with the number of times an individual eats or drinks sugar containing food stuffs in between meals. It is therefore recommended that an individual should have a frequency of sugar consumption of not more than four times per day. [5] To attain the recommended frequency, oral health professionals should therefore advocate snacking of fruits and vegetables instead. [6]

Hygiene behaviours of an individual influence health status and contribute to the general appearance of an individual. [7] The behaviours include bathing, hair and nail hygiene, hand hygiene and tooth-brushing. Hand hygiene for instance, is a good measure of preventing microbial pathogen contamination of food and drinks. Consequently it is an effective measure against gastrointestinal infections and is associated with lowering respiratory infection. [8,9] Likewise, tooth brushing as a means of plaque removal is fundamental in the prevention of periodontal diseases. [10]

In low-income countries, good hygiene practices among adolescents are reported to range from 87.0% to 99.0% for hand washing with water before meals, 30% to 61.8% for hand washing with soap, 14.8% to 82.5% hand washing after toilet and 42.0% to 88% for tooth brushing. [8,11-15] Eating of vegetable and fruits among adolescents is said to range from 29% to 52%, 33% to 43.2%, respectively. [16-18] Moreover, the proportion of adolescents with high intake of sugary food consumption has been reported to range from 48.3% to 54.3%. [15,19]

Adolescents are considered healthy people in most populations. [20] In the United States for example, a study showed that they accounted for only 9.1% of all outpatient visits from 1994 to 2003. [21] Furthermore; Masatu et al. [22] reported that most of the adolescents' visits to health facilities are for therapeutic rather than preventive reason. In relation to hygiene, adolescents with good hand hygiene behaviours are less likely to have had a medical visit and those with good oral hygiene behaviours such as tooth brushing and flossing are more likely to visit dentists. [23,24]

It is reported that unhealthy behaviours tend to cluster in people who are socio-demographically disadvantaged. [25] Irregular tooth brushing habits, unhealthy eating behaviours, poor hand hygiene behaviours are frequently reported in socio-demographically disadvantaged adolescents as compared to their counterparts. [15,16,26]

Adolescence is the age of acquiring health behaviour, which has likelihood to last a lifetime. Therefore, the aim of this study was to investigate adolescents' hygiene behaviours, dietary behaviours and to measure whether they are associated dental and medical consultation.

MATERIALS AND METHODS

The study was a cross-sectional survey that was carried out in twelve regions representing the six zones of Tanzania. A stratified multistage cluster sampling technique was used. In the first stage, stratification was done for the twelve regions into urban and rural of which they were further stratified into primary and

secondary schools. At school level the four specific age clusters (11, 13, 15 and 17 years) of 50 students each were selected to take part in the study making the final sample of about 400 students from each region. Ultimately 4,847 forms were dully filled, a response rate of over 100%.

A Kiswahili structured questionnaire adopted from the WHO Global Oral Health Programme was used for data collection. The questionnaire inquired information on socio-demographic information, dietary habits, hygiene practices as well as medical and dental consultation in the past twelve months. The face validity and reliability of the questionnaire was assessed prior to implementation of the study.

Data entry, processing and analysis was done using SPSS computer program version 20.

Sex was scored as 1= male, 2= female; age in years; parental education as; 1= no formal education, 2=unfinished primary education, 3= primary education, 4= ordinary secondary education, 5=advanced secondary education, 6= university; area of residence as 1= urban, 2= peri-urban, 3= rural; school level as 0= primary, 1= secondary. The dietary habits were scored for each item (consumption of sugared milk, soft drinks, sweets, chewing gum, biscuits/ cakes, vegetables, fresh fruits, fresh juice, mineral water/water) as 1= never, 2= seldom, 3= once or several times in a week, 4= once or more often a day. Hygiene practices were scored as; tooth brushing 1= seldom, 2= once a day, 3= twice a day 4= three times a day; washing hand before eating, after using toilet and using soap for hand washing as; 1=never, 2 rarely, 3= sometimes, 4= most of the time 5= always. Medical consultation was score as 1= no visit, 2= 1-3 times, 3= 4-5 times, 4= more than 5 times whereas dental consultation; 1= once, 2= twice, 3=three times, 4= more than three times and 5= no visit.

To facilitate analysis, variables were re-coded and some computed. Age was re-coded into younger adolescents (11-14 years) and older adolescents (15-17 years); mother's and father's level of education into up to primary education (no formal education, unfinished primary education and primary education) and secondary education or higher (ordinary secondary education, advanced secondary education and university). Hygiene practices were re-coded into often (most of the time and always) and seldom (never, rarely and sometimes), and later scores for the four activities were summed and dichotomized into good (often practiced all four behaviours) and poor (not often practicing the four behaviours) hygiene behaviour. The two dietary habits; sugary and healthy eating habits were re-coded into often (once or several times in a week and once or more often a day) and seldom (never and seldom). Consulting medical or dental personnel was re-coded into yes (consulted at least once) and no (had not consulted at all).

Statistical Analysis

Frequency tables for all the variables were generated and presented as proportions. Cross-tabulations and chi-square statistics for bivariate association of dietary habits and hygiene practices with socio-demographics, medical and dental consultation were conducted. Binary logistic regression in odds ratios and 95% confidence interval was used to adjust for confounders and determine the influence of socio-demographic factors and medical/dental consultation on the dietary habits and hygiene practices. The level of significance was set at p-value < 0.05.

RESULTS

The socio-demographic characteristics of participants are presented in Table 1. A bit more than half of the participants were; aged 15 to 17 years (50.5%), females (51%), primary school attendees (51%), urban residents (52.9%) and born to fathers who had secondary to university education (50.6%). Nearly sixty percent (59.2%) of the participants had mothers whose education was up to primary school.

Table 1: Distribution of the study participants by socio-demographic characteristics

Characteristic	Categories	Percentage (n = 4847)
Age	11 to 14 years	49.5
	15 to 17 years	50.5
Sex	Female	51
	Male	49
School stage	Primary school	51.0
	Secondary school	49.0
Area of residence	Rural	47.1
	Urban and peri-urban	52.9
Fathers' level of education	Up to primary education	49.4
	Secondary education or higher	50.6
Mothers' level of education	Up to primary education	59.2
	Secondary education or higher	40.8

In Table 2, the participants' body and oral hygiene practices are presented. Nearly all (92%) often brushed their teeth and 85.8% often washed hands before eating, eventually 51% generally exhibited good hygiene behaviours.

Table 2: Frequency distribution of participants' hygiene, sugary and healthy eating behaviours

Behaviours	**Categories**	**Percentage (n=4847)**
Hygiene behaviours		
Washing hands before eating	Often	85.8
	Seldom	14.2
Wash hands after toilet	Often	79.4
	Seldom	20.6
Used soap wash hands	Often	61.3
	Seldom	38.7
Brush your teeth	Once or more times a day	92.0
	Seldom	8.0
Hygiene behaviours	Good hygiene behaviours	51.0
	Poor hygiene behaviours	49.0
Sugary eating behaviours		
Drink milk with sugar	Often	38.8
	Seldom	61.2
Drink cola/pepsi	Often	38.6
	Seldom	61.4
Eat sweets	Often	44.5
	Seldom	55.5
Chew sugary gum	Often	38.4
	Seldom	61.6
Eat biscuits/cakes	Often	39.2
	Seldom	60.8
Sugary eating behaviours	Sugar less than three items	63.7
	Sugar three to five items	36.3
Healthy eating behaviours		
Eat vegetables	Often	76.2
	Seldom	23.8
Eat fresh fruits	Often	42.1
	Seldom	57.9
Drink fresh juice	Often	30.0
	Seldom	70.0
Drink mineral water/water	Often	56.8
	Seldom	43.2
Healthy eating	Two or more healthy items	66.8
	Less than two healthy items	33.2

Regarding sugary eating behaviours, a bit more than one third reported to often drink or eat sugar containing food stuffs. Eating sweets was done by 44.5%, biscuits or cakes by 39.2% and drinking Cola or Pepsi by 38.6%. A considerable proportion of the participants (66.8%) often eat two or more healthy items. The most often eaten healthy food item was vegetables (76.2 %), Table 2.

The utilization of health services among participants in terms of consulting a dentist or a medical doctor at least once during 12 months preceding the study was 27.3% and 60.5%, respectively.

Table 3: Percentages of participants with body hygiene, healthy eating and sugary eating behaviours by socio-demographic characteristics

Characteristics	Categories	Good hygiene behaviours	Eating healthy	Sugar three to five items
		(n = 4,847)	**(n = 4,847)**	**(n = 4,847)**
Age	11 to 14 years	46.4	66.6	37.5
	15 to 17 years	55.6 **	67.0	35.1
Sex	Female	50.3	65.6	37.6
	Male	51.8	68.0	34.9 *
School stage	Primary school	45.9	66.0	37.1
	Secondary school	56.4 **	67.6	35.5
Area of residence	Rural	47.5	66.6	34.4
	Urban and peri-urban	54.2	67.0	38.0 *
Fathers' level of education	Up to primary education	46.1	66.9	35.1
	Secondary education or higher	55.8 **	66.7	37.5
Mothers' level of education	Up to primary education	48.6	65.9	34.0
	Secondary education or higher	54.5 **	68.1	39.6 **

Key: * $p < 0.05$ ** $p < 0.001$

Table 3 presents distribution of participants' body hygiene, healthy eating and sugary eating behaviours by socio-demographic factors. Statistically significantly ($p < 0.001$) larger proportions of older adolescents (55.6%), secondary school attendees (56.4%), whose fathers (55.8%) and mothers (54.5%) had secondary to university education demonstrated good hygiene behaviour than their counterparts. Often eating three to five sugary items was significantly more frequent among females (37.6%, $p<0.05$), urban dwellers (38.0%, $p<0.05$) and participants whose mothers had secondary to university education (39.6%, $p < 0.001$). Healthy eating behaviours were not associated with any studied socio-demographic characteristic.

Overall good hygiene behaviours were statistically significantly associated with participants having consulted a medical doctor (64.5%, $p \leq 0.001$) but not with consulting a dentist (28.4%), Table 4.

Table 4: Distribution of participants' body hygiene behaviours by their medical or dental consultation

Hygiene behaviours	**Categories**	**Consulted a Medical doctor (n=2933)**	**Consulted a dentist (n=1325)**
Washing hands before eating	Often	61.1	26.5
	Seldom	56.7 *	32.5 **
Wash hands after toilet	Often	63.0	27.1
	Seldom	51.0 **	28.3
Used soap wash hands	Often	63.5	29.0
	Seldom	55.8 **	24.7 **
Brush your teeth	Once or more times a day	60.9	27.1
	Seldom	55.6 *	30.5
Hygiene behaviours	Good hygiene behaviours	64.5	28.4
	Poor hygiene behaviours	56.4 **	26.2

Key: * $p < 0.05$ ** $p < 0.001$

Table 5 shows the participants' habits of sugar intake by dental consultation; compared to adolescents who did not consult a dentist, relatively higher proportions of participants who often consume milk with sugar, Cola or Pepsi, biscuits or cakes and chewing sugary gum had consulted a dentist.

Table 5: Percentages of participants (n=4847) with intake of sugar items by dental consultation

Sugary eating behaviours	**Categories**	**Consulted a dentist (n = 1325)**	**Did not consult a dentist (n = 3522)**
Drink milk with sugar	Often	46.6	35.9
	Seldom	53.4	64.1**
Drink cola/pepsi	Often	47.2	35.3
	Seldom	52.8	64.7**
Eat sweets	Often	46.3	43.8
	Seldom	53.7	56.2
Chew sugary gum	Often	43.8	36.3
	Seldom	56.2	63.7**
Eat biscuits/cakes	Often	46.1	36.6
	Seldom	53.9	63.4
Sugary eating behaviours	Three to five sugary items	44.9	33.0
	Less than three sugary items	55.1	67.0**

Key: * $p < 0.05$ ** $p \leq 0.001$

Though not significant, smaller proportions of participants who seldom; eat vegetables (62.8%, p=0.070), eat fresh fruits (59.9%, (p=0.319), drink fresh juice (60.1%, p=0.364) or water (59.2%, p=0.116) had consulted a medical doctor. Equal proportions (p=0.590) of participants consumed either two or more healthy items (60.8%) or less than two healthy items (60%).

Table 6: Adjusted binary logistic regression in OR (95% CI) for participants (n=4847) with good hygiene and frequent sugar consumption by socio-demographic characteristics, medical and dental consultation

Characteristic	Categories	**Good hygiene behaviours**	Frequent sugar consumption
Age	11 to 14 years	1	1
	15 to 17 years	1.1 (0.8, 1.5)	1.3 (1.0, 1.8)
Sex	Female	1	1
	Male	1.0 (0.9, 1.2)	0.8 (0.7, 0.9)*
School level	Primary school	1	1
	Secondary school	1.6 (1.2, 2.1)**	1.2 (0.9, 1.7)
Area of residence	Rural	1	1
	Urban and peri-urban	1.2 (1.1, 1.4)	1.1 (1.0, 1.3)*
Fathers' level of education	No formal education to Primary education	1	1
	Secondary to University Education	1.4 (1.2, 1.6)**	0.9 (0.8, 1.1)
Mothers' level of education	Up to primary education	1	1
	Secondary education or higher	0.9 (0.8, 1.1)	1.2 (1.1, 1.4)*
Medical consultation	Up to primary education	1	-
	Consulted a medical doctor	1.4 (1.2, 1.6)**	-
Dental consultation	Did not consult a dentist		1
	Consulted a dentist		1.6 (1.4, 1.9)**

Key: * $p < 0.05$ ** $p < 0.001$

Table 6 informs that the odds (95% confidence limits) of having good hygiene behaviours was significantly higher among secondary school students, 1.6 (1.2, 2.1), urban dwellers 1.2 (1.1, 1.3), if fathers had secondary to university education 1.4 (1.2, 1.6) and those who visited a medical doctor within the past 12 months 1.4 (1.2, 1.6). Significantly higher odds of frequent sugar consumption was found among urban dwellers 1.1 (1.0, 1.3), those who had mothers with secondary to university education 1.2 (1.1, 1.4) and those who visited a dentist within the past 12 months 1.6 (1.4, 1.9). On the other hand, male students were less likely to have high frequency of sugar consumption 0.8 (0.7, 0.9) compared to their female counterparts.

DISCUSSION

Participants of this study were drawn from all five Tanzanian geographical zones which is strength of the study; thus, the findings are considered representative to adolescents and young people of the Tanzanian community. The participants were evenly distributed socio-demographically despite their geographical differences implying that the Tanzanian community is homogeneous with no obvious social disparities. This observation is contrary to marked population disparities observed in high-income countries like USA or India. [27,28]

It is worth noting that good hygiene behaviours are observed in half of the adolescents studied; practicing all studied hygiene behaviours (tooth brushing, washing hands before eating, after toilet and using soap) is a good and encouraging situation but the level is short of Tanzania's goal towards improved sanitation coverage. [29] Possible contributing factors to these adolescents' good hygiene behaviours include; culture and nature of food which requires an individual to wash hands before eating. On the other hand, use of soap in washing hands and washing hands after toilet though substantial amongst the adolescents, it is faced by challenges because provision of running water and availability of soap in toilets is not guaranteed in public areas, in this case schools. Lower proportions were observed by Dobe et al. among Indian adolescents, where only 32.5% practiced good hand washing and by Pengpid and Peltzer among

Tanzanian adolescents who reported 30% to always use soap for hand washing. [12,30]

Tooth brushing being the most prevalent good hygiene behaviour, reflects a true situation where traditionally in-school adolescents brush their teeth in the morning as part of their routine. Our findings are comparable to those of Mashoto et al. among school children of similar age who reported 78.1% to brush their teeth at least once per day but contrary to those of Varenne et al. among 12 years olds Burkina Faso children where 58% claimed not to clean their teeth at all. [14,15]

In adjusted analysis of hygiene behaviour the secondary school attendees, those residing in the urban area and whose fathers had secondary to university education showed higher odds of having good hygiene behaviours and such pattern may be explained by family socio-economic factors that influences awareness and availability of hygiene enabling facilities at their homes. Furthermore, for the rural dwellers having poorer hygiene behaviours is likely due to lack of hygiene facilitating environment such as running water in toilets at homes or public areas like schools. This is supported by earlier studies by Åstrøm and Mbawalla in Tanzania and Dongre et al. in India who reported that access to hygiene facilities at schools influence good hygiene behaviours and that only 8% of rural schools had lavatory facilities, respectively. [31,32] Our findings are comparable to those of Tran et al. among adolescents of three Pacific countries. [26]

Contrary to observation by Prater et al. that adolescents with good hand hygiene behaviours were less likely to have had a medical visit, larger proportions of participants in this study who had good hygiene behaviours had consulted a medical doctor. [23] Probably as people seek medical services at health facilities they access information on general hygiene behaviours. On the other hand, most hygiene behaviours did not associate with consultation to a dentist because it is uncommon for dental professionals to give information on general body hygiene other than tooth brushing. Unlike results of DeDonnoa who reported visiting a dentist to be associated with brushing teeth at least once a day, tooth brushing was not significantly associated with visiting a dentist in this study. [24] A trend similar to our findings was reported by Petersen et al. among Chinese adolescents whereby those with regular oral hygiene practices were less likely to have a dental visit. [33]

Healthy eating was reasonably recorded for eating vegetables but other studied food stuffs namely fresh fruits, fresh juice and water were not eaten in sufficient frequency. This observation may be explained by the traditionally uniform eating of vegetables by Tanzanian communities. On the other hand, fruits, fresh juice and water are eaten insufficiently due to limitation on regular availability and awareness on their health importance; thus, consumed sporadically rather than as part of healthy eating behaviour. Comparable findings on fruits consumption was reported by Doku et al. among Ghanaian adolescents. [16] A slightly lower proportion for vegetable eating (52%) was reported among Ghanaian adolescents and much lower proportion for fruits and vegetables (19.4%) was reported by Al Ani et al. among Eastern Mediterranean Region adolescents. [16,34]

Having no socio-demographic variations in healthy eating behaviours may be related to the homogeneity nature of the study participants. Contrary to our findings, Doku et al. reported socio-demographic gradient in terms of adolescents' age and parental education in eating vegetables and fruits. [16]

Lack of differences in consulting a medical doctor between those often and those seldom eating healthy food items may be supported by the fact that adolescents are considered as healthy people in most population, hence the impact of the current healthy eating behaviours is unlikely to be evident in the existing medical visits rather is expected at a later age. [20]

More than one third of the study participants often eating sugary food stuffs is an indication of a risk for dental caries given the fact that caries preventive strategies (e.g. use of fluoridated tooth paste and fissure sealing) are insufficient in Tanzania. [35,36] Our findings are unlike those of Mbawalla et al. and Mashoto et al. who reported higher proportions of Tanzanian adolescents often eating sugary food stuff. [15,37]

Higher proportions of urban dwellers, girls and those whose mothers had secondary education or higher having frequent sugary food consumption is likely to be due to easy availability of sugar products in urban areas, girls' fondness of sweets and increased mothers' purchasing power following education attainment. Our findings are similar to those of Blay et al. who reported that females and urban residents were more likely to consume sugared snacks than their counterparts. [38]

A larger proportion of those often eating sugary food items (milk with sugar, Cola or Pepsi, biscuits or cakes and chewing sugary gum) to have consulted a dentist explain a known role of sugar in caries causation since most studies report dental visit to be due to pain, usually associated with dental caries. [5,19,39,40] Our results are comparable to those of Peltzer and Pengpid who reported low daily snack consumption to be associated with less than one annual dental care visit. [41] Sugary eating behaviours have immediate impact on oral health reflected by adolescents with frequent consumption of sugary foods to have consulted a dentist.

CONCLUSION

In general, adolescents in Tanzania had good hygiene behaviours; tooth brushing being the most practiced behaviour and use of soap to wash hands the least. Sugar consumption frequency was noteworthy whereas eating vegetables was the most reported healthy eating behaviour. The socio-demographics positively influenced good hygiene behaviours while they were negatively associated to frequent sugar consumption. Whilst, having medical and dental consultation was positively linked to good hygiene and frequent sugar consumption.

Recommendation

Health professionals should encourage adolescents to minimize sugar snacking while often eat vegetables, fruits and water for good future health. Oral health professionals should enhance the dental caries preventive strategies other than limiting sugar consumption in order to control caries increase. Government should enable hygiene facilities at schools in order to inculcate good hygiene behaviours among adolescents and thereby improve the school environment for better health.

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